Attorney Docket No. 2965.906REI03

REISSUE APPLICATION DECLARATION AND POWER OF ATTORNEY

I hereby declare that:

Each inventor's residence, mailing address and citizenship are stated below next to their name.

I believe the inventors named below to be the original and first inventor(s) of the subject matter which is described and claimed in Patent No. 6,321,776, granted November 27, 2001 and for which a reissue patent is sought on the invention entitled DOUBLE DIAPHRAGM PRECISION THROTTLING VALVE,

the specification of which

[ ] is attached hereto.

[x] was filed on November 25, 2003 as reissue application number 10/722,168 and was amended on November 25, 2003, April 30, 2007, and October 9, 2007.

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by the amendments referred to above as well as by the Amendment attached hereto as Exhibit A.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I verily believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)

[ ] by reason of a defective specification or drawing.

[x] by reason of the patentee claiming less than he had the right to claim in the patent.

[ ] by reason of other errors.

At least one error upon which reissue is based is described below.

Claim 1 of the patent, the sole independent claim, claims a "drive means on said diaphragm" and "operator means cooperable with said drive means." The legal scope of these means-plus-function limitations is limited by statute to the specific embodiments disclosed in the specification and structural equivalents thereof. The disclosed invention, however, does not require any specific drive or operator structure. Hence, the claims of the patent are unduly narrow, thereby rendering the patent partly inoperative in covering the full scope of the disclosed invention. New independent claims 11, 21, and 33 of the amendment attached hereto as Exhibit A, do not recite either a "drive means" or an "operator means," are therefore broader than any of the original claims 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10, and thus serve to correct the above identified error.

All errors corrected in this reissue application arose without any deceptive intention on the part of the applicant.

As a below named inventor, I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this declaration is directed:

Wayne L. Pratt
Full name of sole or joint inventor (given name, family name)

Sole or Joint Inventor's signature

11-4-08
Date

Scottsdale, AZ
Residence

United States
Citizenship:

16028 North 63rd Street, Scottsdale, AZ 85254
Mailing Address

William Michael Kolarik
Full name of second joint inventor, if any (given name, family name)

William Michael Kolarik — October 29, 2008
Inventor's signature — Date

Phoenix, AZ — United States
Residence (City and either State or Foreign Country) — Citizenship

918 West Wagon Wheel Drive, Phoenix, AZ 85021
Mailing Address

EXHIBIT A

REISSUE PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of: Attorney Docket No.: 2965.906US03

Pratt et al. Confirmation No.: 7515

Application No.: 10/722,168 Examiner: Kevin L. Lee

Filed: November 25, 2003 Group Art Unit: 3753

For: DOUBLE DIAPHRAGM PRECISION THROTTLING VALVE

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

INTRODUCTORY COMMENTS

In response to the Office Action of July 30, 2008, amendment to the above-identified patent application is requested.

The present amendment comprises the following sections:

A. Amendments to the Specification

B. Amendments to the Claims

C. Remarks

Please grant any extension of time necessary for entry; charge any fee due to Deposit Account No. 16-0631.

AMENDMENTS TO THE SPECIFICATION

In the Specification

Please substitute the following amended paragraph(s) and/or section(s) (deleted matter is shown by strikethrough and added matter is shown by underlining):

Col. 1, lines 54-58:

Where D is the height of the flow channel, v the fluid velocity, ρ the density, and μ_e the fluid viscosity. Furthermore, the pressure drop, ΔP, along the channel is expressed differently for laminar flow ~~that~~ than for turbulent flow which occurs ~~and~~ at higher Reynolds numbers.

Col. 1, line 63 – Col. 2, line 11:

Where K and K' are constants of proportionality that depend on the engineering units selected. It can be clearly seen that the pressure drop, hence, the throttling effect on the flow stream is a linear relationship to the fluid velocity for laminar flow and a velocity squared relationship for the turbulent flow case. Obviously the ideal case is a linear relationship of pressure loss to flow velocity across the throttling range. A less desirable situation is the square law response where the response of the valve continuously varies over the throttling range. Any configuration that results in the flow response being linear over a portion of the range and transitioning to square law at some point will have a detrimental effect on the ability of the controller to smoothly regulate the flow. In additions, since both relationships contain the length factor L in the numerator it is desired to have some length to the throttling path.

Col. 2, lines 12-31:

In order to provide a throttling effect it is necessary to control the opening of the fluid channel. Many means are described in the art. These are typically motors, solenoids, compressed

air, or manual adjustment devices. The applications envisioned herein all contain a flow meter to measure the flow and advanced electronics to position the valve to achieved the desired mass or volumetric flow rate. Thus, the position of the valve is not so much of interest as is the results measured by a suitable flow meter. However, in such feed back arrangement the valve undergoes continuous repositioning, and therefore must have a reliable drive mechanism with little or no backlash. Furthermore, as the fluids may be under pressures up to 100 psi the drive mechanism must operate with a wide range of axial loads. Generally drive mechanisms described in the references were judged as incapable of continuous repositioning, or would exhibit excessive backlash detrimental to smooth fluid control. A second feature found to be overlooked in the current art is the ability to remove the drive mechanism and inspect it without the risk of opening the fluid path.

In the Claims

Please amend the claims relative to the originally issued patent as follows:

1. (Once Amended) A free draining throttling valve comprising:

(a) a valve body defining an inlet and an outlet;

(b) a first throttling surface positioned between said inlet and outlet, said first throttling surface comprising an island having a generally annular outer peripheral surface;

(c) a diaphragm structure [having] including a primary diaphragm [surface] and a secondary diaphragm [surface], said primary and secondary diaphragms [surfaces] being spaced-apart and being joined at peripheral edges to form an internal [diaphragm] volume chamber in said diaphragm structure;

(d) said primary diaphragm having a lower surface defining a second [mating] throttling surface, said second throttling surface including an annulus with an inner peripheral surface opposing the outer peripheral surface of said island, at least a portion of said second throttling surface sealingly engageable with at least a portion of said first throttling surface [island];

(e) drive means operably coupled with [on] said diaphragm structure;

(f) operator means operably coupled [cooperable] with said drive means for selectively positioning said diaphragm structure [between an] in a flow blocking position in which the second throttling surface is sealingly engaged with the first throttling surface, thereby closing off a fluid flow through said valve, and further for selectively positioning said diaphragm structure in a plurality of open flow control positions in which a throttling gap is established between said first and second throttling surfaces, said throttling gap causing a substantially [in which a] linear pressure drop in the fluid

flow [occurs] with increasing flow velocity [and a flow blocking position in which the primary diaphragm closes off flow at said island].

2. (Once Amended) The valve of claim 1, wherein a weep hole extends from through said valve body into said [diaphragm] internal volume chamber.

3. (Once Amended) The valve of claim 1, wherein said outer peripheral surface of said island [has] is tapered [side walls] and said throttling gap is between said outer peripheral surface [side walls] and said [throttling] inner peripheral surface of said annulus.

4. (Once Amended) The valve of claim 1, wherein said drive means comprises a threaded shaft on said diaphragm and wherein said operator means comprises a motor driven rotor in threaded engagement with said drive means.

5. (Once Amended) The valve of claim 4, further comprising a drive housing, and wherein said rotor is mounted in thrust bearings captured between the rotor and the drive housing.

6. (Once Amended) The valve of claim 1, wherein the valve body is formed from a corrosive chemical resistant material.

7. (Once Amended) The valve of claim 1, further comprising a drive housing, and wherein said [body has an upper and lower section and said] diaphragm structure is retained

[therebetween] between said drive housing and said valve body at said peripheral edges [of said diaphragm].

8. (Once Amended) The valve of claim 4, wherein the [roter] rotor is driven by a stepper motor.

9. (Once Amended) The valve of claim 4, wherein said rotor is biased to provide a pre-load to oppose fluid pressure.

10. (Once Amended) The valve of claim 1, wherein said primary and secondary diaphragms [surfaces] are provided with annular ripples that deform as the diaphragm structure flexes.

11. (New) A free draining throttling valve comprising:

(a) a valve body defining an inlet and an outlet;

(b) a first throttling surface positioned between said inlet and outlet, said first throttling surface comprising an island having a generally annular outer peripheral surface;

(c) a diaphragm structure including a primary diaphragm and a secondary diaphragm, said primary and secondary diaphragms being spaced-apart and being joined at peripheral edges to form an internal volume chamber in said diaphragm structure;

(d) said primary diaphragm having a lower surface defining a second throttling surface, said second throttling surface including an annulus with an inner peripheral surface opposing the outer peripheral surface of said island, at least a portion of said second throttling surface sealingly engageable with at least a portion of said first throttling surface; and

(e) a drive assembly operably coupled with said diaphragm structure for selectively positioning said diaphragm structure in a flow blocking position in which the second throttling surface is sealingly engaged with the first throttling surface, thereby closing off a fluid flow through said valve, and further for selectively positioning said diaphragm structure in a plurality of open flow control positions in which a throttling gap is established between said first and second throttling surfaces, said throttling gap causing a substantially linear pressure drop in the fluid flow with increasing flow velocity.

12. (New) The valve of claim 11, wherein the internal volume chamber is fluidly coupled with the atmosphere through a weep hole.

13. (New) The valve of claim 11, wherein each of the primary and secondary diaphragms have annular ripples that deform as the diaphragm structure flexes.

14. (New) The valve of claim 11, wherein the drive assembly includes a drive train operably coupled with the flexible diaphragm structure and an operator operably coupled with the drive train.

15. (New) The valve of claim 14, wherein the drive train includes a threaded shaft on the flexible diaphragm structure and a rotor threadedly engaged with the threaded shaft.

16. (New) The valve of claim 15, wherein the rotor is rotatably mounted between a pair of thrust bearings.

17. (New) The valve of claim 16, wherein the rotor is biased to provide a pre-load to oppose fluid pressure.

18. (New) The valve of claim 16, wherein the operator is a stepper motor.

19. (New) The valve of claim 11, wherein the body portion is formed from chemically resistant polymer material.

20. (New) The valve of claim 19, wherein the chemically resistant polymer material is PTFE.

21. (New) A throttling valve comprising:

a body portion defining an inlet passage, an outlet passage, and a fluid cavity in fluid communication with the inlet passage and the outlet passage;

an upwardly facing valve seat disposed around the inlet passage in the fluid cavity, said valve seat comprising a projecting island having an outer surface with an outer peripheral surface portion;

a flexible diaphragm structure having a bottom surface facing into the fluid cavity so as to define the top wall of the fluid cavity, the bottom surface having a valve portion opposing the valve seat, the valve portion defining a recess adapted to receive said

projecting island therein, the recess having an inner surface with an inner peripheral surface portion opposing the outer peripheral surface portion of the projecting island, the valve portion being selectively positionable with the flexible diaphragm structure in a flow blocking position wherein the valve portion is sealingly engaged with the valve seat thereby closing off a fluid flow through the valve, the valve portion being further selectively positionable in a plurality of open flow control positions wherein a throttling gap is established between the outer peripheral surface portion and the inner peripheral surface portion, the throttling gap presenting a substantially linear pressure drop in the fluid flow with increasing flow velocity therethrough; and

a drive assembly operably coupled with the flexible diaphragm structure for selectively positioning the valve portion.

22. (New) The valve of claim 21, wherein the flexible diaphragm structure includes a primary diaphragm portion and a secondary diaphragm portion, the primary and secondary diaphragm portions being spaced-apart to define an internal volume chamber in the diaphragm structure.

23. (New) The valve of claim 22, wherein the internal volume chamber is fluidly coupled with the atmosphere through a weep hole.

24. (New) The valve of claim 22, wherein each of the primary and secondary diaphragm portions have annular ripples that deform as the diaphragm structure flexes.

25-29. (Cancelled)

30. (New) The valve of claim 21, wherein the body portion is formed from chemically resistant polymer material.

31. (New) The valve of claim 30, wherein the chemically resistant polymer material is PTFE.

32. (Cancelled)

33. (New) A throttling valve assembly comprising:

a body portion presenting an inlet passage and an outlet passage, the inlet passage and outlet passage being in selective fluid communication;

a valve seat disposed around the inlet passage;

a flexible diaphragm structure presenting a throttling surface having a valve portion, the valve portion being matingly engageable with the valve seat, wherein the flexible diaphragm structure is shiftable between a first flow-blocking position in which the valve portion and the valve seat are matingly engaged such that the inlet passage and the outlet passage are not in fluid communication, and a second open flow position in which the valve portion and the valve seat are not matingly engaged such that the inlet passage and the outlet passage are in fluid communication; and

a drive assembly operably coupled with the flexible diaphragm structure adapted to shift the flexible diaphragm structure between the first and second positions.

REMARKS

Claims 1-24, 30 and 31 are pending. By this Amendment, no claims are cancelled, original claims 1-10 are presented as previously once amended and indicated to be allowable, new claims 11-24, 30, and 31, are re-presented as previously indicated to be allowable, and additional new claim 33 is added. Pursuant to the requirements of 37 C.F.R. 1.173(c), support for each claim amendment and added claim relative to claims 1-24, 30 and 31 has been indicated in previous amendments. Support for new claim 33 is found in the specification as follows:

No.	Claim Text	Corresponding Specification Disclosure
33.	A throttling valve assembly comprising:	Original claim 1; column 2, lines 36-54; Figures 1-4; column 4, lines 14-34.
	a body portion presenting an inlet passage and an outlet passage, the inlet passage and outlet passage being in selective fluid communication;	Original claim 1; column 2, lines 36-54; Figures 1-4; column 4, lines 14-34.
	a valve seat disposed around the inlet passage;	Original claim 1; column 2, lines 36-54; Figures 1-4; column 4, lines 14-34.
	a flexible diaphragm structure presenting a throttling surface having a valve portion, the valve portion being matingly engageable with the valve seat, wherein the flexible diaphragm structure is shiftable between a first flow-blocking position in which the valve portion and the valve seat are matingly engaged such that the inlet passage and the outlet passage are not in fluid communication, and a second open flow position in which the valve portion and the valve seat are not matingly engaged such that the inlet passage and the outlet passage are in fluid communication; and	Original claim 1; column 2, line 45 through column 3, line 57; Figures 1-4; column 4, lines 14-67.
	a drive assembly operably coupled with the flexible diaphragm structure adapted to shift the flexible diaphragm structure between the first and second positions.	Original claim 1; column 2, line 60 through column 3, line 57; Figures 1-4; column 4, lines 35-67

Claims 1-24, 30, and 31 stand rejected because the Examiner has indicated that the reissue oath/declaration filed with the application is defective because it fails to identify at least one error which is relied upon to support the reissue application. Submitted herewith is a revised declaration having an error statement that identifies a "single word, phrase, or expression...in an original claim, and how it renders the original patent wholly or partly inoperative or invalid." MPEP § 1414(II)(B). Specifically, the revised error statement submitted herewith states that "[c]laim 1 of the patent, the sole independent claim, claims a 'drive means on said diaphragm' and 'operator means cooperable with said drive means'" and that "the claims of the patent are unduly narrow, thereby rendering the patent partly inoperative in covering the full scope of the disclosed invention," thereby identifying at least one error in the claims "by reference to the specific claim(s) and the specific language wherein lies the error." MPEP § 1414(II)(C).

Further, solely in order to advance prosecution and even though the law contains no such requirement, the revised error statement submitted herewith points out the differences between the newly added claims 11-24, 30, 31, and 33 and the original claims 1-10 by the statement that "[n]ew independent claims 11, 21, and 33, submitted in the amendment attached hereto, do not recite either a 'drive means' or an 'operator means,' are therefore broader than any of the original claims 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10, and thus serve to correct the above identified error."

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,

Bradley J. Thorson
Registration No. 52,288

Customer No. 24113
Patterson, Thuente, Skaar & Christensen, P.A.
4800 IDS Center
80 South 8th Street
Minneapolis, Minnesota 55402-2100
Telephone: (612) 349-5756